



Spectral Gamma-Ray Borehole  
Log Data Report

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Borehole

40-03-09

Log Event A

### Borehole Information

|                         |                                  |                                  |
|-------------------------|----------------------------------|----------------------------------|
| Farm : <u>S</u>         | Tank : <u>S-103</u>              | Site Number : <u>299-W23-153</u> |
| N-Coord : <u>36,242</u> | W-Coord : <u>75,912</u>          | TOC Elevation : <u>662.80</u>    |
| Water Level, ft :       | Date Drilled : <u>10/31/1971</u> |                                  |

### Casing Record

|                            |                                |                    |
|----------------------------|--------------------------------|--------------------|
| Type : <u>Steel-welded</u> | Thickness : <u>0.280</u>       | ID, in. : <u>6</u> |
| Top Depth, ft. : <u>0</u>  | Bottom Depth, ft. : <u>130</u> |                    |

### Borehole Notes:

According to the driller's records, this borehole was not perforated or grouted. This borehole was originally drilled in 1971 to a depth of 100 ft, but was extended in 1973 to a depth of 130 ft. The driller's log records a starter casing of unknown dimensions was installed to a depth of 18 ft. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

### Equipment Information

|                                   |   |  |
|-----------------------------------|---|--|
| Logging System : <u>1</u>         | Detector Type : <u>HPGe</u>               | Detector Efficiency: <u>35.0 %</u>     |
| Calibration Date : <u>04/1996</u> | Calibration Reference : <u>GJPO-HAN-5</u> | Logging Procedure : <u>P-GJPO-1783</u> |

### Log Run Information

|                                 |                                  |                                     |
|---------------------------------|----------------------------------|-------------------------------------|
| Log Run Number : <u>1</u>       | Log Run Date : <u>06/14/1996</u> | Logging Engineer: <u>Kim Benham</u> |
| Start Depth, ft.: <u>0.0</u>    | Counting Time, sec.: <u>100</u>  | L/R : <u>L</u> Shield : <u>N</u>    |
| Finish Depth, ft. : <u>20.0</u> | MSA Interval, ft. : <u>0.5</u>   | Log Speed, ft/min.: <u>n/a</u>      |

  

|                                 |                                  |                                       |
|---------------------------------|----------------------------------|---------------------------------------|
| Log Run Number : <u>2</u>       | Log Run Date : <u>06/17/1996</u> | Logging Engineer: <u>Gary Lekvold</u> |
| Start Depth, ft.: <u>130.0</u>  | Counting Time, sec.: <u>100</u>  | L/R : <u>L</u> Shield : <u>N</u>      |
| Finish Depth, ft. : <u>19.0</u> | MSA Interval, ft. : <u>0.5</u>   | Log Speed, ft/min.: <u>n/a</u>        |



Borehole

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Log Event A

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## Analysis Information

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Analyst : S.D. Barry

Data Processing Reference : P-GJPO-1787

Analysis Date : 03/10/1997

### Analysis Notes :

This borehole was logged in two log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137 and Co-60 were detected around this borehole. The presence of Cs-137 was measured continuously from the ground surface to about 20 ft, intermittently from 20 to 121 ft, and continuously from 121 to 130 ft (the total depth logged). The maximum Cs-137 concentration was 347.8 pCi/g at the ground surface, which is considered an apparent concentration value. The maximum Cs-137 concentration value measured below the surface was 65.8 pCi/g at 0.5 ft.

The radionuclide Co-60 was measured continuously from the ground surface to about 11 ft, intermittently from 11 to 22 ft, almost continuously from 22 to 36.5 ft, and intermittently from 36.5 to 44.5 ft. The maximum Co-60 concentration value was 8.2 pCi/g at 1.5 ft.

The K-40 log plot shows three regions of elevated concentration values: between 53 and 56 ft, 61 and 65 ft, and 70 and 80 ft. The U-238 and Th-232 log plots also show regions of elevated concentration values between 61 and 65 ft and 70 and 80 ft. Beginning at about 82 ft, the KUT concentrations increase.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank S-103.

### Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A time-sequence plot of historical gross gamma logs from 1975 to 1978 is included. The combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.